

WE CLAIM:

1. A polymer gel electrolyte separator for electrochemical devices which comprises:

a polymeric matrix;

5 an ionically conductive solid compound; and

a liquid electrolyte containing at least one salt.

2. A solid state separator for electrochemical devices which comprises:

an ionically conductive solid compound;

a polymeric binder; and

10 a liquid electrolyte containing at least one salt.

3. A polymer gel electrolyte separator for electrochemical devices which comprises:

a polymeric matrix;

a solid metal oxide;

15 an ionically conductive solid compound; and

a liquid electrolyte, containing at least one salt.

4. A solid state separator for electrochemical devices which comprises:

a solid metal oxide;

an ionically conductive solid compound;

20 a polymeric binder, and

a liquid electrolyte, containing at least one salt.

5. A polymer gel electrolyte separator as described in Claim 1 or 3, in which said ionically conductive solid compound is selected from the group consisting of lithium fluoride, magnesium fluoride and sodium fluoride.
6. A solid state separator as described in Claim 2 or 4, in which said ion-
5 conductive solid compound is selected from the group consisting of lithium fluoride, magnesium fluoride and sodium fluoride.
7. A separator as described in Claim 5, in which said fluorides are in the range of 10% to 85% by weight.
8. A separator as described in Claim 6, in which said fluorides are in the
10 range of 10% to 90% by weight.
9. A separator as described, in Claim 1 or 2 or 3 or 4 in which said electrochemical devices are lithium based batteries, sodium based batteries, magnesium based batteries, capacitors, ultracapacitors and hybrid pseudocapacitors.
10. A separator as described in Claim 9, in which said lithium based batteries
15 are lithium-ion batteries.